

What is claimed is:

SUB
A,
1. A surface acoustic wave device comprising:
a quartz substrate;
a piezoelectric thin film disposed on the quartz substrate
and having a positive temperature coefficient of delay; and
5 an interdigital electrode disposed in contact with the
piezoelectric thin film; wherein

the quartz substrate has an angle ϕ at the Euler angle (0,
 ϕ , θ) which is selected such that the quartz substrate has a
negative temperature coefficient of delay at a predetermined
propagation direction θ , and the piezoelectric thin film has a
thickness H which is selected such that a fundamental mode of a
leaky surface acoustic wave is excited on the quartz substrate
and the surface acoustic wave device operates using the
fundamental mode of the leaky surface acoustic wave.

2. A surface acoustic wave device according to claim 1,
wherein a normalized film thickness H/λ obtained by dividing the
thickness H of the piezoelectric thin film by a wavelength λ of
the leaky surface acoustic wave to be excited is within a range
5 of about 0.01 to about 0.15.

3. A surface acoustic wave device according to claim 1, wherein the angle ϕ is within a range of about 119° to about 167° .

4. A surface acoustic wave device according to claim 1, wherein the angle ϕ is within a range of about 119° to about 138° .

5. A surface acoustic wave device according to claim 1, wherein the propagation direction θ is in a range of about 85° to about 95° .

6. A surface acoustic wave device according to claim 1, wherein the piezoelectric thin film is made of a material selected from the group consisting of ZnO, AlN, Ta₂O₅, or CdS.

7. A surface acoustic wave device according to claim 6, wherein the piezoelectric thin film is made of ZnO.

8. A surface acoustic wave device according to claim 1, wherein said interdigital electrode is located between the piezoelectric thin film and the quartz substrate.

9. A surface acoustic wave device according to claim 8,
further comprising a ground electrode disposed on the
piezoelectric thin film.

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